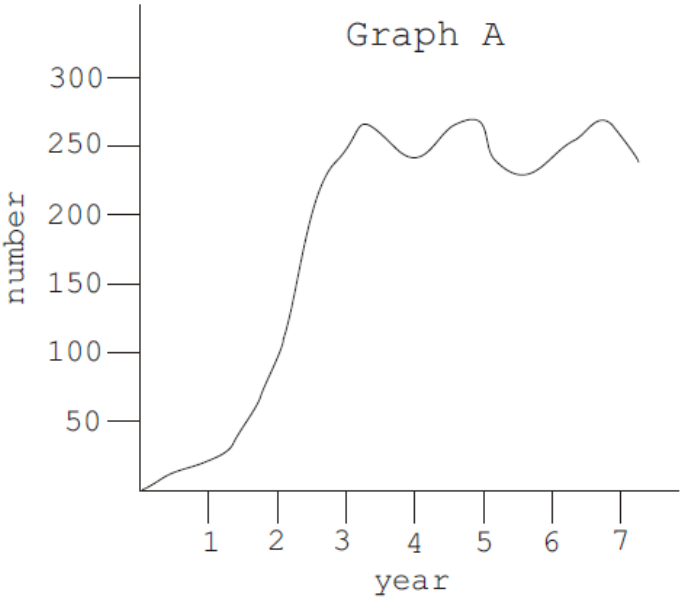
Carrying Capacity Introduction Questions

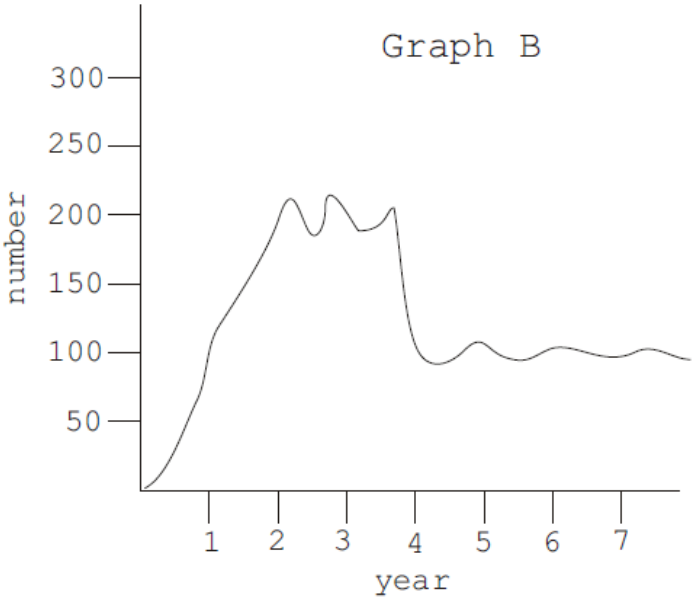
1) Looking at the picture, write your own definition of carrying capacity.
2) According to the picture, which factors affect carrying capacity?
3) What other factors that may affect a carrying capacity?
4) Refer to the following statement when answering the next questions.

"The carrying capacity of this lake equals 150 minnows."

a) Can less than 150 minnows live in this lake? Why or why not?
b) Can more than 150 minnows live in this lake? Why or why not?
c) Let's say that there are 140 minnows in this lake when the amount of resources in this lake decreases and the carrying capacity drops from 150 to 100 minnows. What will happen to this minnow population? Why will this happen?

Refer to the following graphs for the next set of questions.



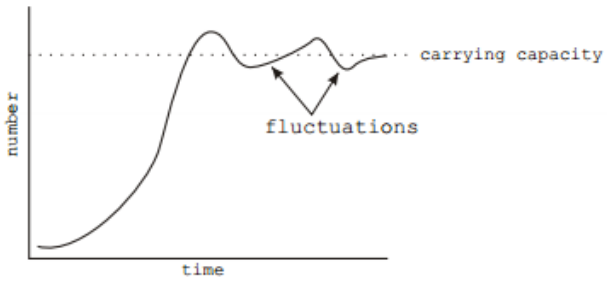


5) FOR GRAPH A:
   a) What is the approximate carrying capacity?
   b) During which year did this population most likely reach the carrying capacity of its ecosystem?
   c) About how many years did it stay at the carrying capacity?
6) FOR GRAPH B:
   a) What are the **two** approximate carrying capacities of this graph?
   b) How many years did this population spend at the first carrying capacity?
   c) During which year did it reach the next carrying capacity?
   d) Which carrying capacity is more stable: the first or the second? Why do you think so?

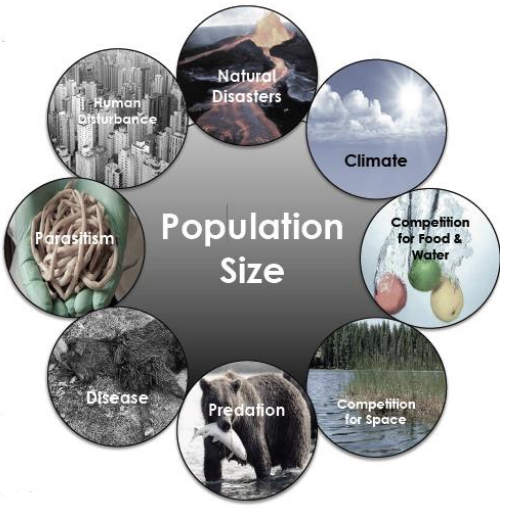
Carrying Capacity Introduction Questions

Carrying Capacity and Limiting Factors

The **carrying capacity** of an ecosystem is considered the maximum population size that environment can support.



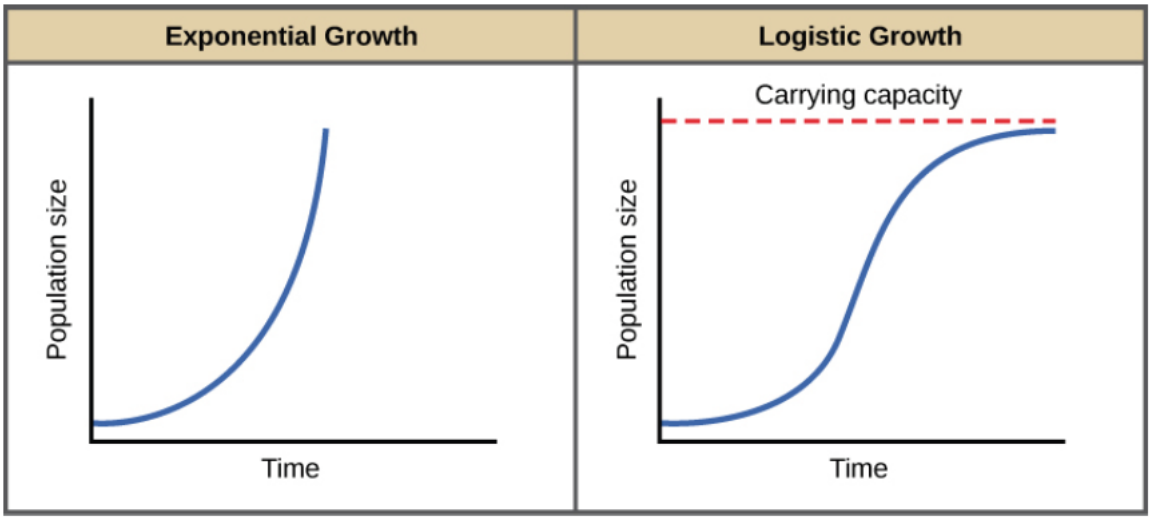
The growth of a population is controlled by factors within the environment that limit the population's size. These are called **limiting factors**. Limiting factors most commonly include availability of living and nonliving resources, predation, competition, and disease. They can be considered **density dependent**, meaning the factors' impact is based on the size (density) of the population, or **density independent**, meaning the factors will have the same impact regardless of the population size. For example, competition is density dependent, whereas a natural disaster is density independent.



Carrying capacity moderates the growth of populations by slowing, stopping, or increasing growth that is dependent upon limited resources or conditions. For example, if the food source of a deer population can only support 1,000 deer that is the carrying capacity for that population. As the population of deer increases, the food source decreases, and competition occurs. Those deer that are better adapted to obtain the food source will survive, while others will die off.

Exponential Growth vs. Logistic Growth

The two most common types of population growth are exponential and logistic population growth. **Exponential growth** occurs when there are unlimited natural resources available. Exponential growth cannot occur indefinitely, as eventually a population will run out of resources. Logistic growth takes into account these limiting factors and carrying capacity of a population in a specific ecosystem. In **logistic growth**, the depletion of resources will slow the rate of growth, eventually reaching a plateau. This is the carrying capacity of a population, and is represented by the letter **K**. The following graphs visually demonstrate the difference between exponential and logistic growth.



https://figures.boundless.com/21346/full/figure-45-03-01.jpe